POWERED BY

Tesla®™

TI2000 GPU-24

GROUND POWER UNIT

Tesla Industries Inc.
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WARNING

*******SHOCK HAZARD POTENTIAL*******

IMPROPER USE/FAILURE TO FOLLOW INSTRUCTIONS IN OPERATORS MANUAL CAN RESULT IN UNIT FAILURE AND/OR POSSIBLE INJURY, OR DEATH, BY ELECTRICAL SHOCK.

THE **TI2000GPU-24** IS A MAINTENANCE FREE, SEALED UNIT

NO REPAIRS ARE AUTHORIZED.

WARRANTY WILL BE **VOID** IF

UNIT IS TAMPERED WITH.

FOR TECHNICAL SUPPORT CONTACT:

TESLA INDUSTRIES INC.

109 CENTERPOINT BLVD.

CENTERPOINT INDUSTRIAL PARK

NEW CASTLE,DELAWARE 19720

PH.(302)324-8910

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WARNING

*******SHOCK HAZARD POTENTIAL*******

ATTEMPTS TO OPEN OR ENTER THE INSIDE OF THIS UNIT (BY USING ANY TOOL OR DEVICE; i.e. PROBE, BORESCOPE, etc.) CAN RESULT IN UNIT FAILURE AND/OR POSSIBLE INJURY BY ELECTRICAL SHOCK. THIS UNIT IS MAINTENANCE FREE AND SHALL NOT BE OPENED OR DISASSEMBLED FOR ANY REASON.

SHIPPING HAZARDS

"NONE"

"DRY" Non-spillable, POWER CELL (battery),

No Free liquids, to leak or toxic gases.

Always protect unit from short circuit.

Return Power cells to Tesla for Recycling.

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CHAPTER 1

INTRODUCTION

1-1. GENERAL

These instructions are for use by the owner/operator. They apply to handling and operation of the TI2000GPU-24 (Turbo Start 2000) ground power unit.

1-2. WARNING, CAUTION, AND NOTE DEFINED

A warning, caution, or note is used to emphasize important and critical instructions as defined for the following conditions:

WARNING

An operating procedure, practice, etc., which, if not correctly followed, could result in personal injury or loss of life.

CAUTION

An operating procedure, practice, etc., which, if not strictly observed, could result in damage to or destruction of equipment.

NOTE

An operating procedure, condition, etc., which is essential to highlight.

1-3. DESCRIPTION

This manual contains the complete operating instructions and procedures for the TI2000GPU-24 (Turbo Start 2000) ground power unit. The Turbo Start 2000 is intended to provide DC electrical ground power for aircraft flight line and maintenance ground support operations. The unit is designed to provide 24 volt DC electrical power output for aircraft engine starting and 24 or 28.5 volts DC electrical support for ground maintenance, avionics/electrical trouble shooting and testing. The observance of procedures, limitations and performance criteria is essential to ensure peak operating efficiency and to maximize operational capabilities and life of the Turbo Start 2000 ground power unit.

1-4. INDEX

The index lists, in alphabetical order, every titled paragraph and figure contained in this manual.

1-5. ABBREVIATIONS AND SYMBOLS

Abbreviations and symbols are used within text, headings and titles. Unless otherwise indicated, the following list of abbreviations and symbols are used in this manual:

LIST OF ABBREVIATIONS AND SYMBOLS

Abbreviation	Definition
amp	Ampere
AC	Alternating Current
C	Celsius
cont	Continuous
DC	Direct Current
F	Fahrenheit
Ft	Feet
FWD	Forward
GPU	Ground Power Unit
Hr	Hour
Hz	Hertz
Kg	Kilograms
Kw	Kilowatts
°	Degree
LED	Light Emitting Diode
MAX	Maximum
MIN	Minimum
VAC	Volts, Alternating Current
VDC	Volts, Direct Current
	Explosion Hazard Potential
	Shock Hazard Potential
	Guard from moisture
	Guard from incorrect power source

1-6. FORMS AND RECORDS

NONE REQUIRED.

1-7. USE OF WORDS SHALL, SHOULD, AND MAY.

Within this technical manual the word **“shall”** is used to indicate a mandatory requirement for proper operation and warranty purposes. The word **“should”** is used to indicate a non-mandatory but preferred method of accomplishment. The word **“may”** is used to indicate an acceptable method of accomplishment.

CHAPTER 2

UNIT DESCRIPTION AND OPERATION

SECTION I. UNIT

2-1. GENERAL

The TI2000GPU-24 (Turbo Start 2000) (Figure 2-1 and 2-2) is a compact, portable and highly versatile 24/28.5 VDC electrical ground power unit. The unit incorporates a 120-240 VAC to 28.5 VDC converter, a 24 volt unique (dry) power cell and an internal intelligent 120 to 240 volt AC charger to recharge the power cells. These built-in features give the Turbo Start 2000 self-sufficiency and mobility for short-term operations without AC electrical power or long term operations with AC electrical power. Short term operations rely solely on power cell output and the fast recharge rates that the unit's internal charger provides from any standard 120 or 240 VAC electrical outlet. Longer term operations incorporate the continuous 20 amp output of the 120-240 VAC to 28.5 VDC converter, or a combination of converter and power cell output to provide 24 VDC output. The following are the unit's four (4) main operational support capabilities:

a. 24 VDC 3000 amp peak power output for engine starting or constant (one hour) rated power output (without a 120-240 VAC power source) for short term trouble shooting and flexible flight line support ground power.

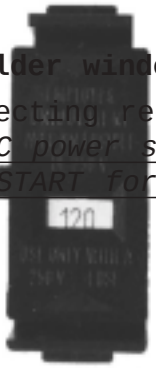
b. 24 VDC constant (one hour) rated power output or variable high load demand output (less than one hour) with a 120-240 VAC power source for extended maintenance (hangar) and routine flight line maintenance, ground support power.

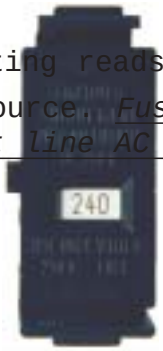
c. 28.5 VDC continuous rated (AC to DC converter) power output with a 120-240 VAC power source for hangar and routine flight line maintenance support, and avionics bench testing.

d. Rapid recharge of the unit's power cells from any 120-240 VAC common power source. This feature eliminates the need for special recharge equipment and dedicated maintenance support man-hours.

WARNING

Check **fuse holder window** to ensure the fuse setting reads either **120** or **240** prior to connecting recharge cord to AC power source. *Fuse setting (120/240) must match AC power source (hangar wall, flight line AC power) prior to connecting TURBO START for recharging.*





(SEE PAGE 2-4 FOR FUSE SETTING PROCEDURES)

SECTION II DESCRIPTION

2.2. GENERAL SPECIFICATIONS

WEIGHT

UNIT:	111 lbs (50.39 Kg)
DC POWER CABLE:	8.5 lbs (3.86 Kg)
AC POWER CORD:	0.4 lbs (0.18 Kg)

INPUT POWER AC

TI2000GPU-24:	105-125 VAC 60 Hz	6.50 amps max.
TI2000GPU-24-UNV:	210-250 VAC 50/60 Hz	3.25 amps max.

TI25000-U01 NORTH AMERICAN LINE CORD

105-125 VAC 60 Hz 6.50 amps max.

TI25000-U04 OLD BRITISH LINE CORD

210-250 VAC 50/60 Hz 3.25 amps max.

TI25000-U03 EUROPEAN 10A/250V

210-250 VAC 50/60 Hz 3.25 amps max.

TI25000-U05 ENGLAND 10A/250V

210-250 VAC 50/60 Hz 3.25 amps max.

OUTPUT POWER DC

CONVERTER:	28.5 VDC TO 20 AMPS, 24 VDC 21 AMPS AND ABOVE.
POWER CELLS:	24 VDC
PEAK OUTPUT:	3000 AMPS

POWER CELL

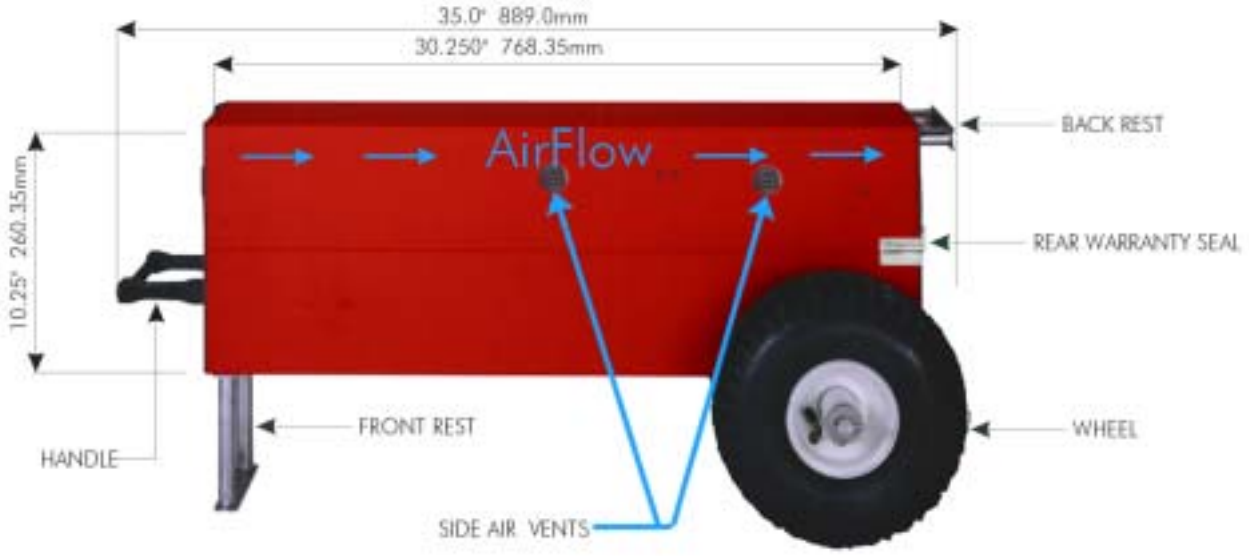
DRY, HIGH RATE DISCHARGE, RECHARGEABLE, MAINTENANCE-FREE

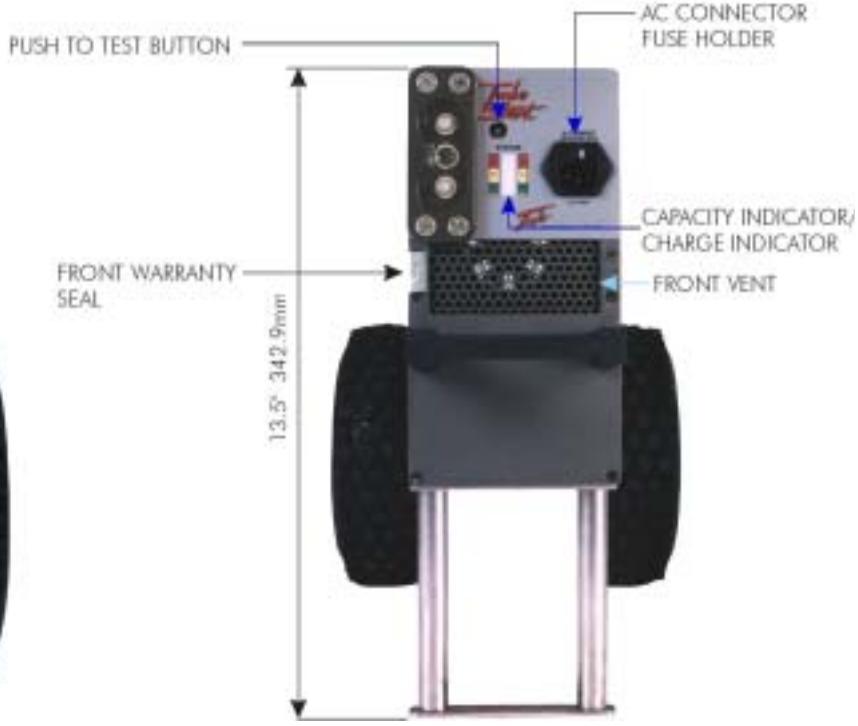
DC POWER CABLE

LENGTH: 8 FT

AIRCRAFT CONNECTOR: 3 PIN RECEPTACLE (MS25488)

DIMENSIONS / UNIT DESCRIPTION





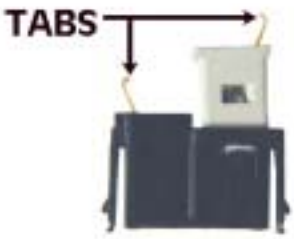
Fuse Setting Procedures
for Switching Voltages or Changing Blown Fuses

1) Grab both tabs on left and right side of the fuse clip. Press tabs inward and pull fuse clip out of housing GENTLY.

2) Completely pull fuse clip from housing, being careful not to drop the fuses from the fuse clip.

3) Note: The fuses are not fastened into the fuse clip, they are lose. Take care to ensure fuses are not dropped or lost.

4) GENTLY pull the white clip from the fuse clip, taking care not to bend any of the tabs. (See enlargement 1)



5) Completely remove the white clip from the fuse clip.

6) Ensure that the proper voltage is selected on the white clip. (See Enlargement 2 & 3)

ENLARGEMENT 2 **120 VAC SETTING**

ENLARGEMENT 3 **240 VAC SETTING**

7) Replace the white clip back into the fuse clip. Take care not to damage the tabs.

8) Completely insert white clip in to fuse clip (GENTLY) until it snaps into place.

9) Insert fuse clip back into fuse housing EVENLY on both sides. DO NOT FORCE, if fuse clip does not go in easy, it means fuses are mis-aligned, realign fuses and insert again.

10) Snap fuse clip back into the housing (GENTLY). DOUBLE CHECK VOLTAGE WINDOW PRIOR TO PLUGGING UNIT INTO AC POWER

CHAPTER 3

OPERATING LIMITS AND RESTRICTIONS

SECTION I. GENERAL

3-1. PURPOSE

Chapter 3 includes all important operating limits and restrictions that must be observed for proper and safe operation of the TI2000GPU-24 (Turbo Start 2000) ground power unit.

3-2. GENERAL

The operating limitations set forth in this chapter are the direct result of design analysis, testing, and operating experience. Compliance with these limitations and restrictions will ensure that owners/operators obtain maximum continued capability from the Turbo Start 2000 ground power unit.

SECTION II. OPERATIONAL RESTRICTIONS AND SAFETY LIMITS

3-3. POWER CELL RECHARGE LIMITS

Any time the unit’s power cells are fully discharged the unit shall be recharged within 24 hours to prevent performance degradation and ensure maximum life.

CAUTION

Unit’s power cells may be damaged if recharged by NiCad or Lead Acid-type battery chargers. Power cells should only be charged by either the TURBO START internal charger and the AC power cord furnished with the equipment, or when connected aircraft external DC power receptacle.

3-4. 120-240 VAC CHARGER AND AC TO DC CONVERTER LIMITS

The unit is designed with a single point AC receptacle for external power to operate both the internal charger and converter. The units AC voltage range can be factory set from 105 to 250 VAC at 50 to 60 Hz depending upon customer requirements. The AC power cord provided with the unit is the mechanism that ensures the specified AC power source is properly supplied to the unit (see paragraph 3-5).Use no others

INTERNAL CHARGER: NO LIMIT AC power cord can remain connected when power cells are fully charged. When the power cells are fully charged the unit's intelligent charger will go to a stand-by mode, monitor the power cells state of charge, and only charge the power cells to ensure they stay at maximum capacity.

INTERNAL AC TO DC CONVERTER: LIMITED (see paragraph 3-6, 3-8 and 3-10). AC power cord does not have to be disconnected when converter power output is no longer required. Once DC power demand is terminated the unit's intelligent charger will remain on line to ensure power cells are charged to maximum capacity.

CAUTION

Unit will be damaged if unapproved AC power is applied.

3-5 AC POWER CORD LIMITS

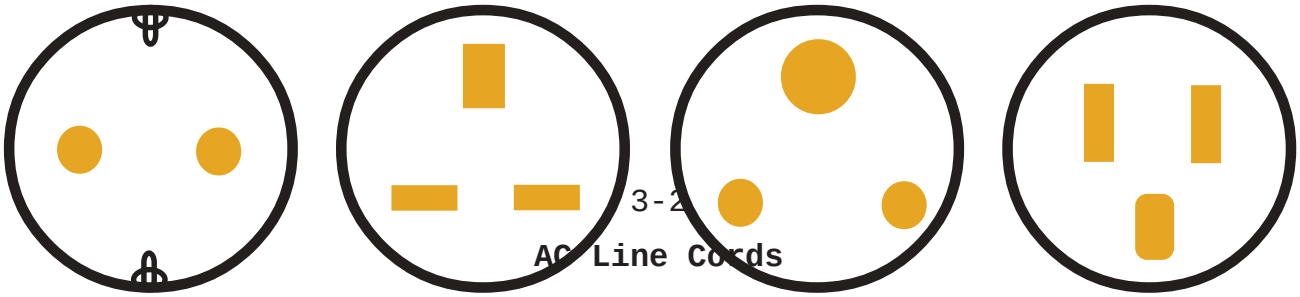
The AC power cord governs which AC power source the unit is set to operate from. The Turbo Start 2000 is supplied with a single customer specified AC power cord. Some customers may specify a universal AC option (for worldwide mobility), which comes with two (2) power cords, one for 120 VAC 60 Hz and the other for 240 VAC 50 Hz (SEE APPENDIX A). Each power cord is marked accordingly. Below are the following three (3) types of AC power cords available and their limits.

120 VAC 60 Hz power cord (USA): LIMITED TO 105-125 VAC 60 Hz power source only.

120 VAC 60 Hz power cord (Universal): LIMITED TO 105 VAC to 250 VAC 50/60 Hz power source using proper cord set.

240 VAC 50 Hz power cord (European): LIMITED TO 210-250 VAC 50-60 Hz power source only.

FOR MORE INFORMATION ON POWER CORDS SEE APPENDIX A



AC Line Cords

Cont. Europe U.K. Old British North American

CAUTION

Unit will be damaged if unapproved AC power is applied by fitting 120 or 240 VAC power cord with any kind of unapproved modification or adapter that changes the specified input power characteristics.

WARNING

********SHOCK HAZARD POTENTIAL*********

Failure to use proper grounding can cause a potential shock hazard! In different countries, the 240 VAC 50 Hz power cord may require the use of a plug adapter to achieve plug style compatibility for 240 VAC 50 Hz operation. Use only adapters with proper grounding mechanism.

3-6. ONE (1) HOUR RATE, 24 VDC CONSTANT OUTPUT

46 amp hour (without AC power connected), power cell output.

(see Figure 5-2)

66 amp hours (with AC power connected), both power cell and AC to DC converter output.

NOTE

If power output is greater than rated amp hour rate, power cell discharge rate will increase correspondingly.

3-7. RATED PEAK OUTPUT (ENGINE STARTING)

3000 peak amps at 25^{O}C (77^{O}F) (See Figure 5-3).

3-8. CONTINUOUS OUTPUT RATE, 28.5 VDC CONSTANT OUTPUT

20 amp hours (with AC power connected)

NOTE

If current demand exceeds 20 amps, converter output voltage will drop below 28.5 VDC and two or more LED status indicator bars will illuminate. If all LED status indicator bars illuminate, both the converter and power cells are supplying 24 VDC power output (see paragraph 3-4 and 4-7.4.).

3-9. ENGINE STARTING POWER

Operators should always ensure the unit is charged above 80% prior to ground support engine starting. However, circumstances may exist during use where unit recharge is not readily available and immediate external engine starting power is required. The following provides minimum states of charge necessary to provide ample power for an efficient engine start under specific current load demands.

ENGINE START CURRENT LOAD DEMAND	MINIMUM CHARGE
650-850 peak starting amps	40% charged
850-1000 peak starting amps	50% charged
1000-1500 peak starting amps	60% charged
1500-1800 peak starting amps	70% charged
1800-2500 peak starting amps	80% charged
2500-3000 peak starting amps	90% charged

3-10. TEMPERATURE

Temperatures refer to the unit's cold/heat soaked temperature. A unit's cold/heat soaked temperature shall be established by the ambient temperature that a unit is exposed to for one (1) hour or more. If unit's cold/heat soaked temperature exceeds operating temperature range, unit shall be stabilized prior to operation as follows: COLD SOAKED, warmed for a minimum of 3 hours above $+10C^{O}$ ($+41^{O}F$) or 2 hours above $+20C^{O}$ ($+68^{O}F$); WARMED SOAKED, cooled for 1 hour below $+38C^{O}$ ($+100^{O}F$).

Operating range:

without AC power $-40C^{O}$ ($-40^{O}F$) TO $+60C^{O}$ ($+140^{O}F$)

with AC Power $-30C^{O}$ ($-22^{O}F$) TO $+50C^{O}$ ($+124^{O}F$)

Storage range:

-60C^{O} (-76^{O}F) TO +60C^{O} (+140^{O}F)

(C0NTINUED ON NEXT PAGE)

CAUTION

Unit may be damaged if operated when unit's cold or heat soaked temperature exceed the specified limit. If unit is operated when cold or heat soaked temperature limit is exceeded, a full functional check should be accomplished prior to continued use.

NOTE

If unit should overheat, an over-temperature sensor will shut down 120-240 VAC functions (charger and converter) until unit cools to normal operating temperatures.

3-11. ENVIRONMENTAL

Operating any electrical equipment in the presence of moisture creates possible safety hazards and/or potential for equipment damage. Every effort has been made, within the scope of existing technology to prevent foreseeable safety hazards and make the Turbo Start 2000 moisture resistant to prevent damage or failure. If the Turbo Start 3000 is exposed to moisture, preventive measures and precautions shall be taken to:

a. prevent accumulation of moisture on AC and DC connectors/receptacles

b. minimize moisture entering FWD inlet and AFT outlet cooling fan vent ports

The limits and operational constraints listed below shall apply for the following environmental (weather) conditions:

Heavy or steady rain:	OPERATION NOT RECOMMENDED
Light rain, drizzle:	NO CONVERTER OR CHARGER 120-240 VAC
fog, snow or sleet:	POWER SHALL BE APPLIED.

Unit inlet and outlet vent ports shall be covered from exposure. Unit shall be kept horizontal.

WARNING

********SHOCK HAZARD POTENTIAL*********

Severe injury, or Death, from electrical shock is possible when personnel and/or Turbo Start 2000 are wet during use and when 120-240 VAC power is being supplied to unit.

CAUTION

Damage may occur if unit is operated after exposure to moisture (rain, drizzle, fog, sleet or snow) or moisture contamination is suspected. DO NOT USE until unit's exterior and receptacles are dried. Operation shall be restricted to use *without 120 or 240 power cord*. DO NOT CONNECT 120 or 240 VAC power cord until unit has been dried for a MINIMUM of one (1) hour, prior to use.

Blowing sand or dust: Minimize exposure to sand and dust when 120-240 AC power is used. Unit shall be kept horizontal during use.

3-12. OPERATING POSITION

Without 120-240 VAC power cord: Horizontal or vertical.

Horizontal only, for propper unit ventilation, when 120-240_ VAC line cord is plugged in and exhaust fan is running.

CAUTION

Unit may be damaged if blown over by propeller, rotor or jet wash, or accidentally knocked over. Unit should be kept horizontal during use.

CAUTION

Unit da inlet and outlet d
and/or s restricted.

3-13. UNIT OPERATION DURING AIRCRAFT FUELING/DEFUELING

Power output is restricted to 24 VDC power cell output only. DO NOT CONNECT 120 or 240 VAC POWER SUPPLY. 120-240 VAC power (charger or AC-DC converter) functions of unit shall not be operated during any aircraft fuel handling operation.

WARNING

*******FIRE/EXPLOSION HAZARD POTENTIAL********

Severe injury, or Death, may occur from fire or explosion, as a result of electrical sparks produced near fuel vapors.

CHAPTER 4

OPERATING PROCEDURES

SECTION I. UNIT OPERATION

4-1. GENERAL

Correct operation of the TI2000GPU-24 (Turbo Start 2000) includes both pre-use and operational checks of the unit. Knowledge of the operating limits, restrictions, performance, unit capabilities and functions is fundamental to correct and safe operation. The operator shall ensure compliance with the instructions in this manual that affect operational safety and the warranty of the unit.

4-2. OPERATING LIMITS AND RESTRICTIONS

The minimum, maximum and normal operating ranges result from careful engineering and evaluation of test data. These limitations must be adhered to during all phases of operation. Refer to Chapter 3, Section II, OPERATING LIMITS AND RESTRICTIONS, for detailed information.

4-3. PERFORMANCE

Refer to Chapter 5, PERFORMANCE DATA to determine the capability of the Turbo Start. Consideration must be given to changes in performance resulting from variations in ambient temperature, mode of operation, state of charge (with or without 120 or 240 VAC power), and aircraft DC bus system inefficiency (voltage drops).

SECTION II. OPERATING PROCEDURES

4-4. OPERATING PROCEDURES

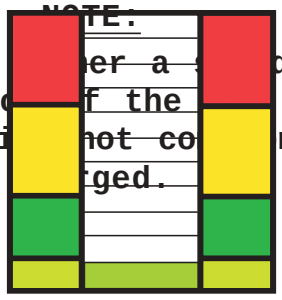
This section deals with normal procedures, and includes all steps necessary to ensure safe and efficient operation of the TI2000GPU-24 (Turbo Start 3000). As experience is gained with the Turbo Start 3000, the user will be able to maximize the unit's unique capabilities to enhance the flexibility of aircraft maintenance and support operations.

NOTE

When the TURBO START 2000 is not in use, it should *always* remain plugged into a suitable AC power source to insure operational readiness at all times. REMEMBER,when the AC line cord is plugged in, the unit must be placed in the horizontal position to allow the cooling fan to operate properly!

4-5. BEFORE OPERATION CHECK

1. *CHECK FUSE WINDOW FOR PROPER SETTING (120/240) BEFORE PLUGGING UNIT INTO THE AC POWER SOURCE TO BE USED*. REMEMBER,when the AC line cord is plugged in, the unit must be placed in the horizontal position to allow the cooling fan to operate properly!



NOTE:

A full charge is indicated by [illegible] dy lighted green bar or a blinking green bar at the bott[illegible]f the [illegible] graph column.The fan will also exhibit ratcheting but wi[illegible]not co[illegible]n when the unit is fully [illegible]ged.

2. CHECK UNIT FOR EVIDENCE OF DAMAGE - Check for dents, punctures, case distortion or misalignment, cracked or loose connectors, and

that cooling fan is functioning.

4-3

REMEMBER, when the AC line cord is in, the unit must be placed in the horizontal position for the cooling fan to operate properly.

Unit may overheat if cooling fan fails. (More than 4 bars present on bar graph)

Do not operate if cooling

3. CHECK DC POWER CABLE/CONNECTORS FOR DAMAGE - Check cable for cuts, chafing or evidence of being crushed. Check connectors for cracks, cuts, distortions, excessive wear, broken/loose fasteners or loose cable attachment.

4-6. 24 VDC GROUND POWER (NO 120 OR 240 VAC POWER SUPPLY) ENGINE STARTING OR DC SYSTEM POWER

1. TRANSPORT UNIT - The Turbo Start 2000 is easily transported using the wheels that are incorparated into the unit. The AXEL EXTENTION kit (included with the unit) ensures that the Turbo Start 2000 is stable. The unit is engineered to be pushed rather than pulled.

2. CONNECT DC POWER CABLE TO UNIT - Ensure power cable connector is fully seated into unit's connector. Set *the unit down horizontally ensuring vent ports are un-blocked.*

3. CONNECT DC POWER CABLE TO AIRCRAFT - Ensure ground power

cable connector is fully seated into aircraft ground power receptacle. DC bus power should come on and aircraft volt meter should indicate 24 VDC to 23.5 VDC (23 VDC minimum).

4. ENGINE STARTING - Check power cable for security and correct installation prior to engine start. Follow ground power engine

starting procedure as specified in aircraft operators manual.

5. REMOVING DC POWER SUPPLY FROM AIRCRAFT

a. Remove DC power cable GPU connector from aircraft.

b. Remove DC power cable connector from Turbo Start (if necessary).

4-7. 24 VDC GROUND POWER (WITH 120/240 VAC POWER) SYSTEM HIGH POWER DEMAND (21 amps and above) OR ENGINE STARTING.

1. TRANSPORT UNIT - The Turbo Start 2000 is easily transported using the wheels that are incorparated into the unit. The AXEL EXTENTION kit (included with the unit) ensures that the Turbo Start 2000 is stable. The unit is engineered to be pushed rather than pulled.

2. CONNECT AC POWER CORD TO UNIT (*CHECK FUSE WINDOW FOR PROPER SETTING*).- - Ensure 120 or 240 VAC power cord is properly connected to an approved AC power supply. *Unit shall be in horizontal position to ensure unit's vent ports are free from blockage*. After approximately 5-8 seconds, unit's LED status indicator will illuminate indicating power cell state of charge. Cooling fan will operate. Ensure LED status indicator and cooling fan are operational prior to continuing to step 3.

3. CONNECT DC POWER CABLE TO UNIT - Ensure power cable connector is fully seated into unit's receptacle.

4. CONNECT DC POWER CABLE TO AIRCRAFT - Connect to aircraft ground power receptacle. DC bus power should come on and aircraft volt meter should indicate 27.5 VDC to 23.5 VDC (23 VDC minimum). If current demand is above 20 amps, converter output voltage will drop below 28.5 VDC and two or more LED status indicator bars will illuminate. At approximately 21 amps of current demand, converter output voltage will be regulated at 24 VDC output and the last (RED) LED status indicator bar will illuminate.

NOTE

When all LED status indicator bars illuminate, both the converter and power cells are supplying 24 VDC power output for current demands above 21 amps (see paragraph 3-4).

5. ENGINE STARTING - UNPLUG AC POWER CORD BEFORE STARTING ENGINE WITH TURBO START. (see paragraph 4-6.). Prior to engine start, ensure power cell charge is sufficient to provide an efficient engine start (see paragraph 3-7).

6. REMOVING DC POWER SUPPLY FROM AIRCRAFT

a. Remove DC power cable GPU connector from aircraft.

b. Remove DC power cable connector from Turbo Start

(if necessary).

4-8 28.5 VDC GROUND POWER (WITH 120/240 VAC POWER) SYSTEM LOW POWER DEMAND (20 amps or less).

1. TRANSPORT UNIT - The Turbo Start 2000 is easily transported using the wheels that are incorparated into the unit. The AXEL EXTENTION kit (included with the unit) ensures that the Turbo Start 2000 is stable. The unit is engineered to be pushed rather than pulled.

2. CONNECT AC POWER CORD TO UNIT (*CHECK FUSE WINDOW FOR PROPER SETTING*).- Ensure 120 or 240 VAC power cord is properly connected to an approved AC power supply. *Unit shall be in horizontal position to ensure unit's vent ports are free from blockage*. After approximately 5-8 seconds, unit's LED status indicator will illuminate indicating power cell state of charge. Cooling fan will operate. Ensure LED status indicator and cooling fan are operational prior to continuing to step 3.

3. CONNECT DC POWER CABLE TO UNIT - Ensure power cable connector is fully seated into unit's receptacle.

4. CONNECT DC POWER CABLE TO AIRCRAFT - Connect to aircraft ground power receptacle. DC bus power should come on and aircraft volt meter should indicate 28.5 VDC to 27 VDC (26.5 VDC minimum). If aircraft power demand is less than 20 amps converter output will remain at 28.5 VDC (only one GREEN LED status indicator bar will illuminate). If aircraft power demand exceeds 20 amps converter voltage output will decrease and two or more LED status indicator bars will illuminate (see paragraph 3-4, and 7-4.4.).

5. REMOVING POWER SUPPLY FROM AIRCRAFT

a. Remove DC power cable GPU connector from aircraft.

b. Remove DC power cable connector from Turbo Start (if necessary).

4-9 POWER CELL RECHARGE

1. CONNECT AC POWER CORD TO UNIT - *Unit shall be in horizontal position to ensure unit's vent ports are free from blockage.* (*CHECK FUSE WINDOW FOR PROPER SETTING*).- Ensure 120 or 240 VAC power cord is properly connected to an approved AC power supply. After approximately 5-8 seconds, ensure unit's LED status indicator illuminates

indicating power cell state of charge and cooling fan is operating.

Unit may overhe fan fails.

Do not operate if cooling fan fails.

2. CHECK FOR FULL CHARGE INDICATION - After 2 HR 30 minutes, LED charge indicator should show a single steady or flashing green LED bar when fully charged, the last LED bar. AC power may be left connected to unit when power cells are fully charged.

NOTE

Under a full charge, two things will be observable with the unit. A non-blinking lighted green bar or a blinking green bar at the bottom of the bar graph, both indicate a full charge.Also the fan will display ratcheting but not come on whe the unit is fully charged.

SECTION III.

FUNCTIONAL CHECK PROCEDURES

4-10. FUNCTIONAL CHECK PROCEDURES

This section deals with normal functional check procedures, and includes all steps necessary to ensure the Turbo Start 2000 is functioning within specific operational parameters prior to operational use. As users gain experience with the Turbo Start 2000, they will incorporate these functional checks as a routine practice.

4-11. REQUIRED EQUIPMENT FOR FUNCTIONAL CHECK.

FLUKE OR EQUIVALENT TYPE DIGITAL MULTIMETER.

4-12. DC FUNCTIONAL CHECK.

1. CHECK UNIT FOR EVIDENCE OF DAMAGE - Check for dents, punctures, case distortion or misalignment, cracked or loose connectors. If no damage is evident proceed to step two.

IF DAMAGE IS EVIDENT contact distributor or manufacturer.

2. ENSURE UNIT IS NOT PLUGGED INTO 120 OR 240 VDC. Unplug AC power if plugged in.

3. CHECK UNIT INTERNAL RESISTANCE (TEST FOR SHORTS) - Better than 10 Megohms. Ensure no short exists.

Negative (-) DC receptacle terminal and unit case.

Positive (+) DC receptacle terminal and unit case.

4. CHECK DC VOLTAGE READING AT DC RECEPTACLE TERMINALS.

24 to 25.5 VDC depending on state of charge.

5. PLUG IN 120 OR 240 POWER CORD. (*CHECK FUSE WINDOW FOR PROPER SETTING*).-Ensure power unit is connected to a suitable AC power source (120 USA or 240 European).

6. CHECK UNIT FOR STATE OF CHARGE - *Unit shall be in horizontal position to ensure unit's vent ports are free from blockage.* After approximately 5-8 seconds, unit LED status indicator shall illuminate indicating power cell state of charge. Ensure LED status indicator

and cooling fan are operational. Prior to continuing to step 7, the LED status indicator should show a single green bar (last LED bar) to indicate the unit’s power cells are fully charged. Also under full charge the fan will ratchet but not enable.

NOTE

Under a full charge, the last green LED bar may blink. This does not indicate a malfunction. A nonblinking lighted green bar or a blinking green bar at the bottom of the LED column, both indicate a full charge.

7. CHECK DC VOLTAGE READING AT DC RECEPTACLE TERMINALS. Ensure power cells are fully charged (see step 6.)

28.5 (+-0.57 VDC) with power cells at full state of charge.

8. FUNCTIONAL CHECK COMPLETE - Unit should remain plugged in to AC power until required for use.

CHAPTER 5

PERFORMANCE DATA

SECTION 1. INTRODUCTION

5-1. PURPOSE

This chapter provides performance data for the TI2000GPU-24 (Turbo Start 2 000). Continual reference to this information will enable the user to obtain maximum performance, utilization and service life from the Turbo Start. Although maximum performance is not always required, regular referral to this chapter is recommended for the following reasons:

a. To generate knowledge of unit’s performance margins to enable the operator to make sound judgment when unexpected conditions or alternate operational requirements are encountered.

b. To enable the user to readily recognize situations requiring maximum performance.

c. To gain experience in accurately estimating the effects of variables for which data is not presented.

d. To help the operator determine if an aircraft system malfunction exists by comparing actual performance with expected performance.

NOTE

The information provided in this chapter is primarily intended for operational planning and is most useful when planning operations under unfamiliar conditions or environmental extremes. The data may also be used to establish local operating procedures and to ensure unit’s operational life is maximized.

5-2. GENERAL

The data presented covers the maximum range of conditions and performance that can reasonably be expected. In each area of performance, the effects of temperature and DC electrical load demand relating to

the ground power support requirements are presented. Wherever practical, data is presented conservatively. However, NO GENERAL CONSERVATISM HAS BEEN APPLIED. All performance data presented is within the applicable limits of the Turbo Start.

SECTION II

DATA CRITERIA

5-3 DATA BASIS

The type of data used is indicated at the bottom of each performance chart under DATA BASIS. The applicable report and date of the data are also given. The data provided generally are based on one of three categories:

a. *Derived From Actual Controlled Testing.* Controlled test data obtained on a similar unit type.

b. *Calculated Data.* Data based on tests, but not on a similar unit type placed under a controlled test.

c. *Estimated Data*. Data based on estimates using rules of physics, mathematics, and electrical engineering principles and concepts, but not verified by tests.

5-4. SPECIFIC CONDITIONS

The data presented are accurate only for specific conditions listed under the title of each chart or graph. Variables for which data are not presented, but which may affect that phase of performance, are discussed in associated text. Where data are available or reasonable estimates can be made, the amount that each variable affects performance will be given.

5-5. GENERAL CONDITIONS

In addition to the specific conditions, the following general conditions are applicable to the performance data.

a. *Variation in Aircraft.* Power demand differences between individual aircraft of the same make and model are known to exist due to variations in DC electrical system efficiency. These differences, however, are considered insignificant and are not individually accounted for.

b. *Ground Support and Aircraft Instrument Variations.* The data

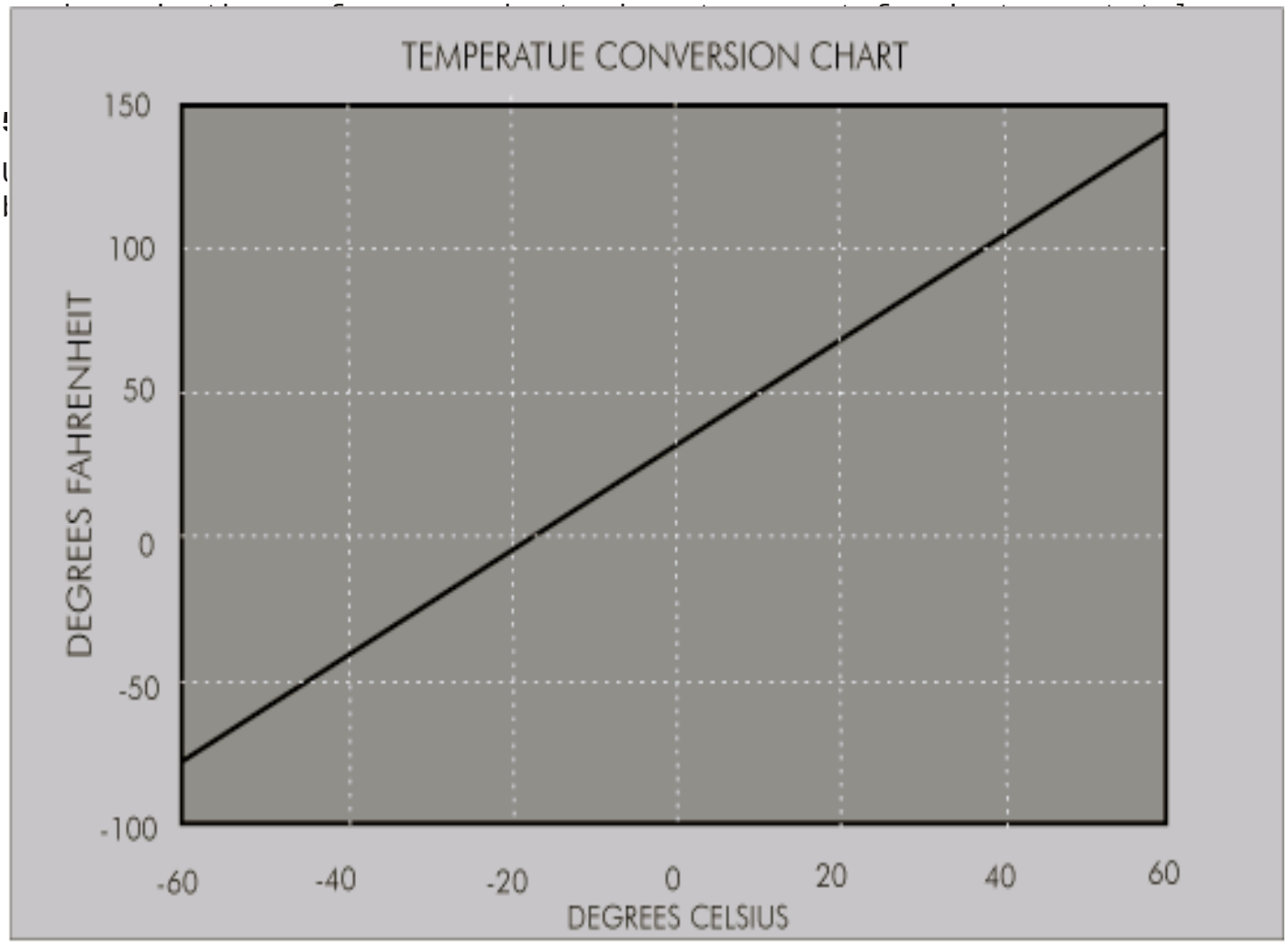

TEMPERATUE CONVERSION CHART
150
100
50
0
-50
-100
DEGREES FAHRENHEIT
-60
-40
-20
0
20
40
60
DEGREES CELSIUS

FIGURE 5-1

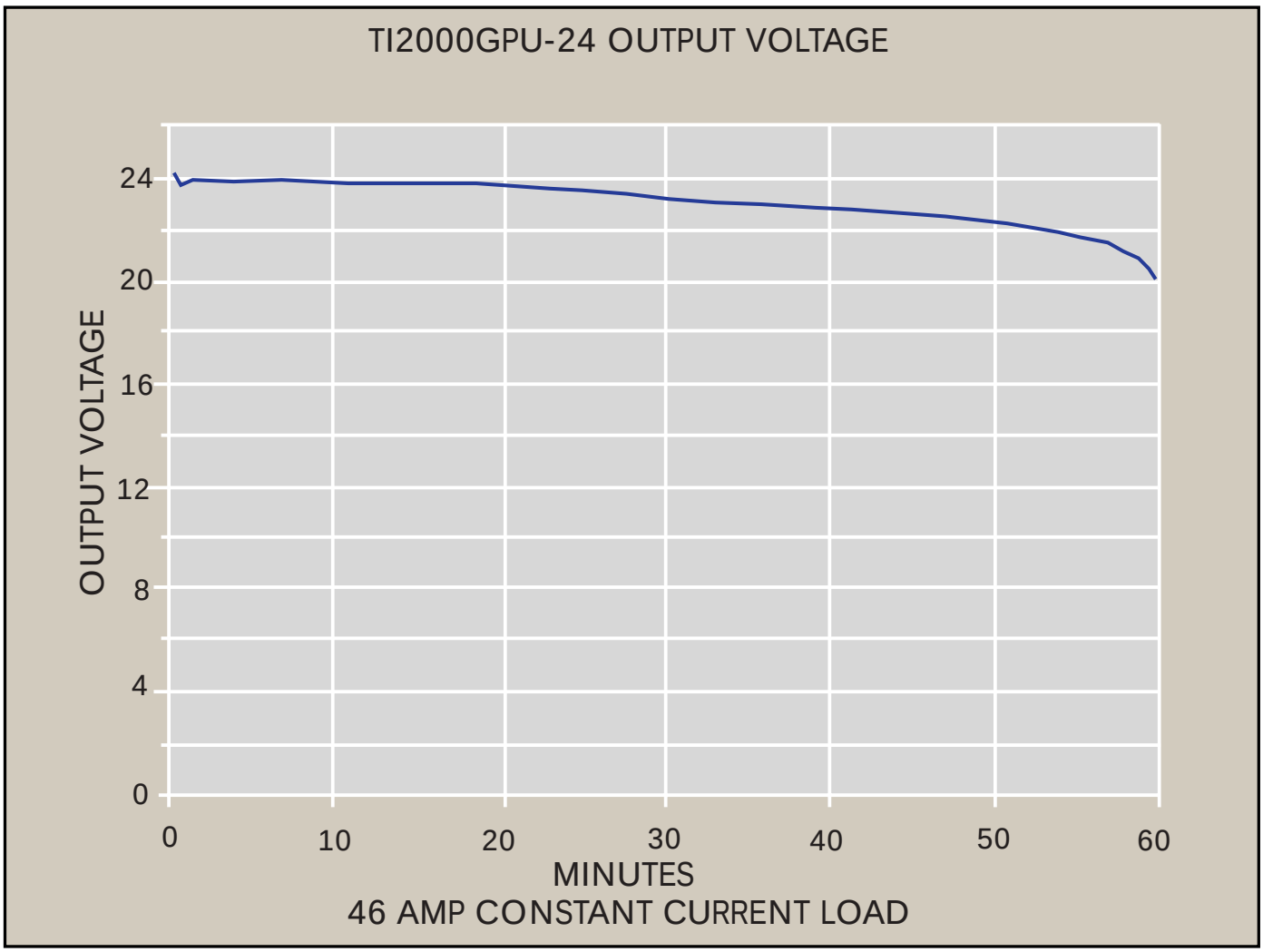

TI2000GPU-24 OUTPUT VOLTAGE
OUTPUT VOLTAGE
24
20
16
12
8
4
0
0
10
20
30
40
50
60
MINUTES
46 AMP CONSTANT CURRENT LOAD

FIGURE 5-2

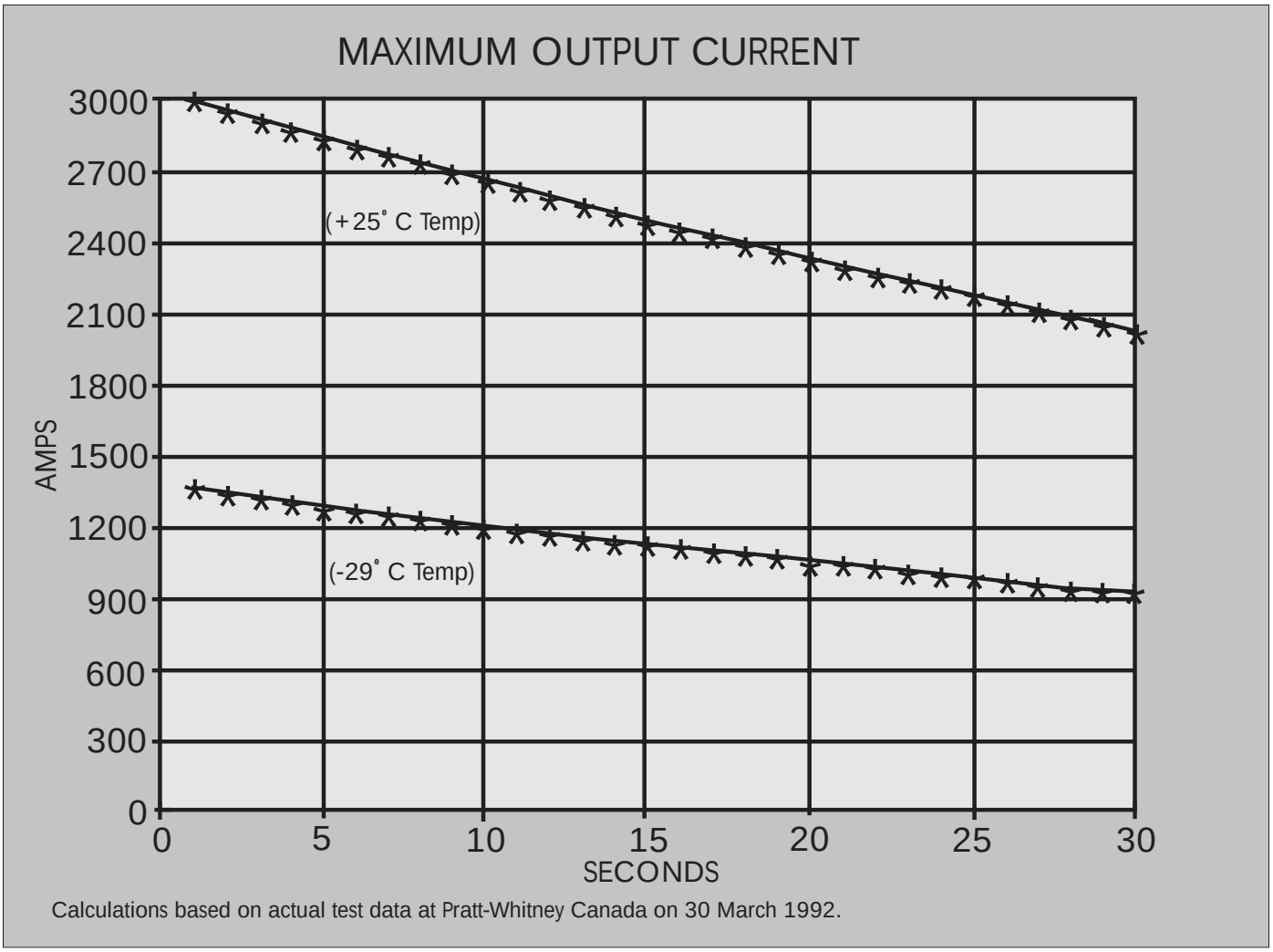

MAXIMUM OUTPUT CURRENT
3000
2700
2400
2100
1800
1500
1200
900
600
300
0
AMPS
(+25° C Temp)
(-29° C Temp)
0
5
10
15
20
25
30
SECONDS
Calculations based on actual test data at Pratt-Whitney Canada on 30 March 1992.

FIGURE 5-3

CHAPTER 6

CARE AND MAINTENANCE

SECTION I. UNIT CARE

6-1. GENERAL

Although the TI2000GPU-24 (Turbo Start 2000) has been ruggedized and made weather resistant within the scope of unit's intended use, it is essential that good general care be taken to maintain unit in good operating condition and to maximize unit's operational life.

6-2. AFTER USE - Unit should be protected from the environmental elements and man made hazards. Ideally unit should be secured in a building or shed. Most importantly, unit shall be fully covered if stored exposed to environmental elements.

1. KEEP UNIT RECEPTACLES AND OUTER CASE CLEAN - wipe with dry cloth.

2. KEEP FOREIGN OBJECTS OUT OF UNIT - Cover unit to prevent foreign objects, water, and dirt from entering vent ports and receptacles.

3. KEEP FROM PROLONGED EXPOSURE TO EXTREMELY DAMP ENVIRONMENTS

Cover unit to prevent migration of moisture. If unit is operated in extremely damp environments unit should be kept in an environmentally controlled building.

4. KEEP UNIT PLUGGED INTO AC POWER SUPPLY WHEN NOT IN USE. (*CHECK FUSE WINDOW FOR PROPER SETTING*). To maximize life of power cells and to ensure unit is always ready for use, unit should remained plugged in to AC power when not in use. NEVER LET DISCHARGED UNIT SIT FOR MORE THAN 24 HOURS WITHOUT FULLY RECHARGING POWER CELLS.

5. PROTECT DC POWER CABLE AND AC POWER CORD FROM DAMAGE - Prevent from being cut, gouged, crushed, dragged or otherwise abused.

SECT

MAINT

6-3. MAINTENANCE OF UNIT - The Tu s a maintenance-free unit, no repairs are authorize l be **void** if unit is tampered with. If unit fails t t Manufactures Warranty Claim (see unit warranty).

WARRENTY VOID STICKERS

Chapter 7

Push To Test Modification

General Information And Operation

7-1. General

THIS MODIFICATION HAS BECOME STANDARD EQUIPMENT FOR EACH OF OUR UNITS. BOTH MILITARY AND CIVILIAN CLIENTS HAVE FOUND THIS MODIFICATION TO BE CRITICAL TO THEIR OPERATION. THE PUSH TO TEST BUTTON IS USED TO INDICATE THE CAPACITY OF THE POWER CELLS WITHOUT APPLYING AC INPUT POWER. IT ALLOWS THE END USER TO CHECK THE STATUS OF THE POWER CELLS. THIS LETS THE OPERATOR KNOW IF THERE IS ENOUGH POWER TO PERFORM ANOTHER ENGINE START, OR IF THE UNIT HAS TO BE RETURNED TO AC POWER TO ALLOW IT TO RECHARGE.

7-2. OPERATION

1) MAKE SURE THAT YOU WAIT AT LEAST 2 MINUTES AFTER AC POWER IS APPLIED, OR DC POWER IS EXTRACTED FROM THE UNIT, BEFORE YOU DEPRESS THE PUSH TO TEST BUTTON. THIS WILL ENSURE A CORRECT READING.

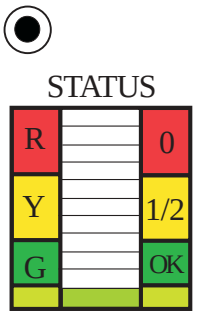
2) WITHOUT AC POWER INPUT OR DC POWER OUTPUT, SIMPLY DEPRESS THE PUSH TO TEST BUTTON ON THE FACE PLATE AND HOLD FOR APPROXIMATELY 15 SECONDS.

3) AT THIS TIME THE LED BAR GRAPH SHOULD LIGHT UP INDICATING THE STATUS OF THE POWER CELLS.

4) THE FAN SHOULD ALSO OPERATE AT THIS TIME. IF YOU DO NOT HEAR THE FAN RUNNING, STOP DEPRESSING THE BUTTON AND CHECK FOR ANY OBSTRUCTIONS TO THE FAN.

5) NEVER DEPRESS THE PUSH TO TEST BUTTON WHILE THE UNIT IS PLUGGED INTO AC POWER FOR RECHARGE, OR PLUGGED INTO AIRCRAFT FOR DC POWER OUTPUT.

6) NEVER DEPRESS THE PUSH TO TEST BUTTON FOR MORE THAN 30 SECONDS. THIS MAY CAUSE A TEMPERATURE SENSOR TO TEMPORARILY DISRUPT PUSH TO TEST FUNCTION. (IF THIS SENSOR IS TRIPPED, ALLOW TEN MINUTES FOR UNIT TO COOL BEFORE OPERATING PUSH TO TEST BUTTON.)



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APPENDIX A

OPTIONAL LINE CORDS FOR WORLDWIDE OPERATIONS

COUNTRY	VOLTS	HZ	TESLA PART #
Afganistan	220	50	TI25000-004 Old British Line Cord Set
Algeria	220	50	TI25000-004 Old British Line Cord Set
American Samoa	240	60	TI25000-011 Australian Line Cord Set
Angola	220	50	TI25000-100 Europlug Line Cord Set
Anguilla (U.K.)	240	50	TI25000-005 United Kingdom Line Cord Set
Antigua	230	60	TI25000-005 United Kingdom Line Cord Set
Argentina	220	50	TI25000-011 Australian Line Cord Set
Aruba	115	60	TI25000-001 North American Line Cord Set
Australia	240	50	TI25000-011 Australian Line Cord Set
Austria	220	50	TI25000-003 Cont. European Line Cord Set
Azores (Portugal)	220	50	TI25000-004 Old British Line Cord Set
Bahamas	120	60	TI25000-001 North American Line Cord Set
Bahrain	220	50	TI25000-005 United Kingdom Line Cord Set
Bangladesh	220	50	TI25000-004 Old British Line Cord Set
Barbados	115	50	TI25000-001 North American Line Cord Set
Belguim	220	50	TI25000-003 Cont. European Line Cord Set
Belize (Br. Hond.)	110	60	TI25000-001 North American Line Cord Set
Benon	220	50	TI25000-004 Old British Line Cord Set
Bermuda	120	60	TI25000-005 United Kingdom Line Cord Set
Bolivia	220	50	TI25000-003 Cont. European Line Cord Set
Botswana	220	50	TI25000-005 United Kingdom Line Cord Set
Brazil	110	60	TI25000-001 North American Line Cord Set
Bulgaria	220	50	TI25000-003 Cont. European Line Cord Set
Burkina Faso	220	50	TI25000-100 Europlug Line Cord Set
Burma (Now Myanmar)	230	50	TI25000-005 United Kingdom Line Cord Set
Burundi	220	50	TI25000-003 Cont. European Line Cord Set
Cambodia	220	50	TI25000-100 Europlug Line Cord Set
Cameroon	230	50	TI25000-003 Cont. European Line Cord Set
Canada	120	60	TI25000-001 North American Line Cord Set
Canary Islands (Spain)	220	b	TI25000-003 Cont. European Line Cord Set
Cape Verde, Rep. of	220	50	TI25000-003 Cont. European Line Cord Set
Cayman Islands	120	60	TI25000-001 North American Line Cord Set
Central African Republic	220	50	TI25000-100 Europlug Line Cord Set
Chad	220	50	TI25000-003 Cont. European Line Cord Set
Channel Islands	240	50	TI25000-005 United Kingdom Line Cord Set
Chile	220	50	TI25000-002 Italian Line Cord Set
China, Peoples Republic of	220	50	TI25000-011 Australian Line Cord Set
Christmas Island (Australia)	240	50	TI25000-011 Australian Line Cord Set
Cocos Islands (Australia)	240	50	TI25000-011 Australian Line Cord Set
Columbia	220	60	TI25000-100 Europlug Line Cord Set
Congo, Republic of	220	50	TI25000-100 Europlug Line Cord Set
Cook Island (New Zealand)	240	50	TI25000-011 Australian Line Cord Set
Costa Rica	120	60	TI25000-001 North American Line Cord Set
Curacao Islands	110	60	TI25000-001 North American Line Cord Set
Cyprus	240	50	TI25000-005 United Kingdom Line Cord Set
Czech, Republic of	220	50	TI25000-003 Cont. European Line Cord Set
Denmark	220	50	TI25000-300 Denmark Line Cord Set
Djibouti, Republic of	220	50	TI25000-003 Cont. European Line Cord Set
Dominica	230	50	TI25000-005 United Kingdom Line Cord Set
Dominican Republic	110	60	TI25000-001 North American Line Cord Set

APPENDIX A (Cont.)

OPTIONAL LINE CORDS FOR WORLDWIDE OPERATIONS

COUNTRY	VOLTS	HZ	TESLA PART #
Ecuador	120	60	TI25000-001 North American Line Cord Set
Egypt	220	50	TI25000-100 Europlug Line Cord Set
El Salvador	115	60	TI25000-001 North American Line Cord Set
England	240	50	TI25000-005 United Kingdom Line Cord Set
Equatorial Guinea	220	50	TI25000-100 Europlug Line Cord Set
Estonia	220	50	TI25000-003 Cont. European Line Cord Set
Ethiopia	220	50	TI25000-003 Cont. European Line Cord Set
Fiji	240	50	TI25000-011 Australian Line Cord Set
Finland	220	50	TI25000-003 Cont. European Line Cord Set
France	220	50	TI25000-003 Cont. European Line Cord Set
French Guiana	220	50	TI25000-003 Cont. European Line Cord Set
Gabon	220	50	TI25000-003 Cont. European Line Cord Set
Gambia	220	50	TI25000-005 United Kingdom Line Cord Set
Georgia	220	50	TI25000-003 Cont. European Line Cord Set
Germany	220	50	TI25000-003 Cont. European Line Cord Set
Ghana	220	50	TI25000-005 United Kingdom Line Cord Set
Gibraltar	240	50	TI25000-005 United Kingdom Line Cord Set
Greece	220	50	TI25000-003 Cont. European Line Cord Set
Greenland (Denmark)	220	50	TI25000-300 Denmark Line Cord Set
Grenada	230	50	TI25000-005 United Kingdom Line Cord Set
Guadeloupe	220	50	TI25000-003 Cont. European Line Cord Set
Guam	110-120	60	TI25000-001 North American Line Cord Set
Guatemala	120	60	TI25000-001 North American Line Cord Set
Guinea	220	50	TI25000-003 Cont. European Line Cord Set
Guinea-Bissau	220	50	TI25000-003 Cont. European Line Cord Set
Guyana	110	50/60	TI25000-001 North American Line Cord Set
Haiti	110-120	50-60	TI25000-001 North American Line Cord Set
Honduras	110	60	TI25000-001 North American Line Cord Set
Hong Kong	220	50	TI25000-005 United Kingdom Line Cord Set
Hungary	220	50	TI25000-003 Cont. European Line Cord Set
Iceland	220	50	TI25000-003 Cont. European Line Cord Set
India	220-250	50	TI25000-004 Old British Line Cord Set
Indonesia	220	50	TI25000-003 Cont. European Line Cord Set
Iran	220	50	TI25000-003 Cont. European Line Cord Set
Iraq	220	50	TI25000-005 United Kingdom Line Cord Set
Ireland, Republic of	220	50	TI25000-005 United Kingdom Line Cord Set
Isle of Man	240	50	TI25000-005 United Kingdom Line Cord Set
Israel	230	50	TI25000-200 Israel Line Cord Set
Italy	220	50	TI25000-002 Italy Line Cord Set
Ivory Coast	220	50	TI25000-100 Europlug Line Cord Set
Jamaica	110	50	TI25000-001 North American Line Cord Set
Japan	110	50/60	TI25000-001 North American Line Cord Set
Jordan	220	50	TI25000-005 United Kingdom Line Cord Set
Kenya	240	50	TI25000-005 United Kingdom Line Cord Set
Korea, South	220	60	TI25000-003 Cont. European Line Cord Set
Kuwait	240	50	TI25000-005 United Kingdom Line Cord Set

APPENDIX A (Cont.)

OPTIONAL LINE CORDS FOR WORLDWIDE OPERATIONS

COUNTRY	VOLTS	HZ	TESLA PART #
Laos	220	50	TI25000-001 North American Line Cord Set
Latvia	220	50	TI25000-003 Cont. European Line Cord Set
Lebanon	220	50	TI25000-100 Europlug Line Cord Set
Lesotho	240	50	TI25000-004 Old British Line Cord Set
Liberia	120	60	TI25000-005 United Kingdom Line Cord Set
Liechtenstein	220	50	TI25000-006 Switzerland Line Cord Set
Lithuania	220	50	TI25000-003 Cont. European Line Cord Set
Luxembourg	220	50	TI25000-003 Cont. European Line Cord Set
Libya	230	50	TI25000-002 Italy Line Cord Set
Macao	220	50	TI25000-004 Old British Line Cord Set
Madagascar	220	50	TI25000-003 Cont. European Line Cord Set
Maderia (Portugal)	220	50	TI25000-004 Old British Line Cord Set
Majorca	220	50	TI25000-003 Cont. European Line Cord Set
Malawi	230	50	TI25000-005 United Kingdom Line Cord Set
Malaysia	240	50	TI25000-005 United Kingdom Line Cord Set
Maldives	230	50	TI25000-004 Old British Line Cord Set
Mali, Republic of	220	50	TI25000-003 Cont. European Line Cord Set
Malta	240	50	TI25000-005 United Kingdom Line Cord Set
Martinique	220	50	TI25000-003 Cont. European Line Cord Set
Mauritania	220	50	TI25000-100 Europlug Line Cord Set
Mauritius	230	50	TI25000-005 United Kingdom Line Cord Set
Mexico	127	60	TI25000-001 North American Line Cord Set
Monaco	220	50	TI25000-003 Cont. European Line Cord Set
Mongolia	220	50	TI25000-100 Europlug Line Cord Set
Montseurrat	230	60	TI25000-005 United Kingdom Line Cord Set
Morocco	220	50	TI25000-003 Cont. European Line Cord Set
Mozambique	220	50	TI25000-003 Cont. European Line Cord Set
Namibia (W.S. Africa)	220-250	50	TI25000-004 Old British Line Cord Set
Nepal	220	50	TI25000-004 Old British Line Cord Set
Neth. Antilles	220	50/60	TI25000-003 Cont. European Line Cord Set
Netherlands	220	50	TI25000-003 Cont. European Line Cord Set
New Caledonia	220	50	TI25000-003 Cont. European Line Cord Set
New Zealand	230	50	TI25000-011 Australian Line Cord Set
Nicaragua	120	60	TI25000-001 North American Line Cord Set
Niger	220	50	TI25000-100 Europlug Line Cord Set
Nigeria	230	50	TI25000-005 United Kingdom Line Cord Set
Norfolk Islands (Australia)	240	50	TI25000-011 Australian Line Cord Set
North Ireland	220	50	TI25000-005 United Kingdom Line Cord Set
North Mariana Islands (U.S.)	115	60	TI25000-001 North American Line Cord Set
Norway	220	50	TI25000-003 Cont. European Line Cord Set
Okinawa	100-120	60	TI25000-001 North American Line Cord Set
Oman	240	50	TI25000-005 United Kingdom Line Cord Set
Pakistan	230	50	TI25000-004 Old British Line Cord Set
Panama	110	60	TI25000-001 North American Line Cord Set
Papua New Guinea	240	50	TI25000-011 Australian Line Cord Set
Paraguay	220	50	TI25000-100 Europlug Line Cord Set
Peru	110	50/60	TI25000-001 North American Line Cord Set
Philippines	115	60	TI25000-001 North American Line Cord Set]
Piccairn Islands (U.K.)	240	50	TI25000-004 Old British Line Cord Set
Poland	220	50	TI25000-003 Cont. European Line Cord Set
Portugal	220	50	TI25000-003 Cont. European Line Cord Set
Puerto Rico	120	60	TI25000-001 North American Line Cord Set
Qatar	240	50	TI25000-005 United Kingdom Line Cord Set

APPENDIX A (Cont.)

OPTIONAL LINE CORDS FOR WORLDWIDE OPERATIONS

COUNTRY	VOLTS	HZ	TESLA PART #
Romania	220	50	TI25000-003 Cont. European Line Cord Set
Russia	220	50	TI25000-003 Cont. European Line Cord Set
Rwanda	220	50	TI25000-100 Europlug Line Cord Set
Saudia Arabia	220	50/60	TI25000-003 Cont. European Line Cord Set
Scotland	220	50	TI25000-005 United Kingdom Line Cord Set
Senegal	220	50	TI25000-003 Cont. European Line Cord Set
Seychelles	240	50	TI25000-005 United Kingdom Line Cord Set
Sierra Leone	230	50	TI25000-005 United Kingdom Line Cord Set
Singapore	230	50	TI25000-005 United Kingdom Line Cord Set
Slovakia	220	50	TI25000-003 Cont. European Line Cord Set
Somalia	220	50	TI25000-003 Cont. European Line Cord Set
South Africa	220-250	50	TI25000-004 Old British Line Cord Set
Spain	220	50	TI25000-003 Cont. European Line Cord Set
Sri Lanka	230	50	TI25000-004 Old British Line Cord Set
St. Pierre & Miquelon (France)	115	60	TI25000-001 North American Line Cord Set
St. Kitts & Nevis	230	60	TI25000-005 United Kingdom Line Cord Set
St. Lucia	240	50	TI25000-005 United Kingdom Line Cord Set
St. Vincent	230	50	TI25000-005 United Kingdom Line Cord Set
Sudan	240	50	TI25000-005 United Kingdom Line Cord Set
Surinam	115	60	TI25000-003 Cont. European Line Cord Set
Svalbard (Norway)	220	50	TI25000-003 Cont. European Line Cord Set
Swaziland	230	50	TI25000-004 Old British Line Cord Set
Sweden	220	50	TI25000-003 Cont. European Line Cord Set
Switzerland	220	50	TI25000-006 Switzerland Line Cord Set
Syria	220	50	TI25000-100 Europlug Line Cord Set
Tahiti	220	50	TI25000-003 Cont. European Line Cord Set
Taiwan	110	60	TI25000-001 North American Line Cord Set
Tanzania	230	50	TI25000-005 United Kingdom Line Cord Set
Thailand	220	50	TI25000-100 Europlug Line Cord Set
Togo	220	50	TI25000-003 Cont. European Line Cord Set
Tonga	115	60	TI25000-004 Old British Line Cord Set
Trinadad & Tobango	230	60	TI25000-005 United Kingdom Line Cord Set
Tunisia	220	50	TI25000-100 Europlug Line Cord Set
Turkey	220	50	TI25000-003 Cont. European Line Cord Set
Uganda	220	50	TI25000-004 Old British Line Cord Set
United Arab Emir.	220	50	TI25000-005 United Kingdom Line Cord Set
United Kingdom & Ireland	240	50	TI25000-005 United Kingdom Line Cord Set
United States	120	60	TI25000-001 North American Line Cord Set
Uraguay	220	50	TI25000-011 Australian Line Cord Set
Venezuela	120	60	TI25000-001 North American Line Cord Set
Vietnam	220	50	TI25000-003 Cont. European Line Cord Set
Virgin Islands	120	60	TI25000-001 North American Line Cord Set
Wales	220	50	TI25000-005 United Kingdom Line Cord Set
Western Samoa	230	50	TI25000-005 United Kingdom Line Cord Set
Yemen	220	50	TI25000-005 United Kingdom Line Cord Set
Yugoslavia	220	50	TI25000-003 Cont. European Line Cord Set
Zaire, Republic of	220	50	TI25000-003 Cont. European Line Cord Set
Zambia	220	50	TI25000-005 United Kingdom Line Cord Set
Zimbabwe	220	50	TI25000-005 United Kingdom Line Cord Set

APPENDIX A (Cont.)

UNIVERSAL LINE CORD KIT FOR WORLDWIDE OPERATIONS

NOTE: TESLA UNIVERSAL AC LINE CORD KIT, P/N: TI25000-U00, IS FOR UNITS ORIGINALLY BUILT WITH THE UNIVERSAL AC LINE CORD OPTION ONLY. THE AC ADAPTER OPTION IS TESLA P/N TI16000-19 AND MUST BE ORDERED WITH THE ORIGINAL PROCUREMENT OF UNIT(S). UNIT(S) MAY BE RETURNED TO TESLA INDUSTRIES, FOR A NOMINAL COST, AND MODIFIED TO ALLOW OPERATION WITH THE UNIVERSAL AC LINE CORD KIT.

TESLA UNIVERSAL AC LINE CORD KIT, P/N: TI25000-U00, IS COMPRISED OF THE FOLLOWING FOUR PART NUMBERS:

TI25000-U01	NORTH AMERICAN LINE CORD
TI25000-U04	OLD BRITISH LINE CORD
TI25000-U03	EUROPEAN 10A/250V
TI25000-U05	ENGLAND 10A/250V

TESLA REPLACEMENT 8 FOOT DC POWER CORD, P/N: TI2006-501, IS AVAILABLE UPON REQUEST. (CUSTOM LENGTHS ARE ALSO AVAILABLE TO SUIT THE CUSTOMERS OPERATIONAL REQUIREMENTS.)